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ABSTRACT

A study of the performance pattern of 1,000 elementary school children in Philadelphia was conducted to determine: (a) whether the inclusive Title I program was having a significant impact on reading achievement, and (b) whether the specific intervention models were producing significant changes in the performance rates of their respective groups. Through the use of a component impact analysis procedure, it has been found that Title I elementary schools in Philadelphia were receiving four intervention models: Educational and Cultural Enrichment, General Instructional and Supportive Support, Intensive Instructional and Supportive Support, and Remediation Programs. The evaluation of the scores of 1,000 pupils from the target population revealed that the four intervention models were producing positive differential gains in reading achievement. When compared with their initial rates of progress, the average pupil increased his rate of progress in reading achievement by 100 percent. In Models 2, 3, and 4, the average pupil improved his rate of progress in reading by more than 100 percent. These results showed that the additive effects of the project input service configurations within the intervention models caused the development of skills/strategies which facilitate improved learning. (Author/JM)

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ABSTRACT

Through the use of a component impact analysis procedure, it was found that Title I elementary schools in Philadelphia were receiving four intervention models: Educational and Cultural Enrichment, General Instructional and Supportive Support, Intensive Instructional and Supportive Support, and Remediation Programs. Analysis of the progress made by children in each intervention model showed that the children in Model 1 made an average yearly gain of 0.87 GE (in grades 4 to 6); Model 2's made 0.76 GE; Model 3's made 0.58 GE, and Model 4's made 0.68 GE. Across all models the average yearly gain was 0.70 GE. Collectively, it was found that each group exceeded the projected decremental gain (0.35 GE/year) and that the combined groups were behind the city's average annual growth by 0.20 GE. Findings of the study suggested that since each intervention model was producing a linear growth, appropriate modifications--through increased funds--could produce significantly greater results.

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DIFFERENTIAL EFFECTS OF TITLE I PROGRAM FUNDS ON READING ACHIEVEMENT IN ELEMENTARY SCHOOLS IN PHILADELPHIA†

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National and local assessments of the impact of Title I program funds have centered around the study of exemplary projects or the repeated measurement of subsamples within the target population. Although these assessments are valid and represent measurements of the outputs of the individual projects, the results of these assessments cannot be easily generalized to answer the broader and more frequently asked question, "What impact is Title I funds having on compensatory education?"

To answer this broader question, an impact component analysis procedure was developed to ascertain the impact of Title I projects on elementary schools in Philadelphia. After three years of project-by-project evaluations which produced consistent information about the output characteristics of the individual projects, the new procedure was instituted to study the additive effects of these individual projects on reading achievement.[1] The impact component analysis showed that elementary schools having more than one project had received the additional project(s) because of the nature, number, and severity of the needs of their pupils. That is, schools having pupils with the greatest number and variety of needs received the greatest number (program density) and variety (program content) of Title I projects. Therefore, the placement procedure tended to conform with the concepts

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of program concentration and comparability.

Title I Intervention Models

To analyze the placement patterns of 16 Title I projects in 69 elementary schools, three project input service codes were established: Basic Skills, Instructional Other (than Basic Skills), and Supportive Services. Using program density as a primary factor, a content analysis of the configuration of projects was performed to determine the additive effects of the project input services on the schools. From this process four implementation or intervention models were identified:

Model 1. Educational and Cultural Enrichment Experiences. This level of program expenditure is directed toward the improvement of a pupil's attitudes and awareness of his own and other social cultures, and an appreciation for the aesthetic qualities of life. The combination of project input services represents a method for improving the teacher's capability to understand and use changes in pupil attitudes (self-perception) as a means for motivating the pupil to perform at his potential.

Model 2. General Instructional and Supervisory Support System. This level of program expenditure is directed toward the improvement of instructional practices at all elementary grades. The combination of project input services represents a method for improving all aspects of the total instructional program of the school. This objective is achieved by an increased number of supplemental programs, supportive materials and supervisory personnel. These input services are designed (1) to improve the teacher's capacity to teach a variety of subjects and (2) to extend the school's repository of instructional alternatives.

Model 3. Intensive Instructional and Supervisory Support System. This level of program expenditure is directed toward the intensification of instruction and supervision in the area of basic skills. The combination of project input services represents a method for improving the teacher's ability to diagnose pupil needs and prescribe appropriate instructional materials/strategies. The input services emphasize a major investment in supportive materials and supervisory personnel. To assist in instructional management, instructional aides are provided.

Model 4. Remediation Programs. This level of program expenditure is directed toward the establishment of permanent basic skill centers and systems which provide the pupil with continuous exposure to (a) individualized instructions, (b) a concentration of new and innovative materials/techniques, and (c) an increased involvement of the school-community support system. The combination of project input services represents the establishment of Instructional Skill Centers where the learning difficulties of the pupils are diagnosed and where individualized, corrective programs are prescribed.

The additive prbperties of the project input services articulated within each intervention model seemed to be directed toward controlling those variables which Bloom identified as being most relevant to school achievement: entry behavior, affective entry characteristics, quality of instruction.[2] Just as Bloom illustrated how his chosen variable effects could be combined to explain most of the variation in school achievement, so do the increasing levels of project input services reflect intervention strategies designed to meet the more destitute pupils.

In a like manner, the intervention models resemble the structural

categories of the five-fold topology of Bissell, which was cited and discussed in the Report to the President's Commission on School Finance.[3] Bissel's topology of educational intervention was based on the characteristics of a program's structure. Bissell's concept of program structure encompassed the hierarchial nature of the program's objectives and the implicit role of the teacher--directive, non-directive. The categories of the five-fold topology are: permissive enrichment, structured enrichment, structured cognitive, structured informational, and structured environmental.

Title I Impact Study

A study of the performance pattern of 1,000 elementary school children was conducted to determine (a) whether the inclusive Title I program was having a significant impact on reading achievement and (b) whether the specific intervention models were producing significant changes in the performance rates of their respective groups. Analysis of the pupil reading achievement scores within the four intervention models revealed not only that the populations of pupils themselves were significantly different, but so were their needs and rates of reading progress. Table 1 presents the average reading gain scores by grade and by model. The data is presented in pairs because each pair of years represents the same group of pupils.

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Place Table 1 about here
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It should be noted that during the 1969-1970 school year, the intervention programs began at grade 4. Therefore, to account for the change in reading performance that could be attributed to the use of

the new materials, teaching strategies, and instructional modalities, grade 4 was considered to be the "tooling-up" year. A tooling-up year is that time interval (a) when the pupils reorient/reconstruct their learning styles and/or modes to the new learning conditions and (b) when the pupils begin to assimilate cues, techniques, and mechanisms of the intervention program for future use.

Given that the project input services of the intervention models were correlated and hierarchially arranged/sequenced over successive school years, those year(s) which follow the tooling-up process are "transference" years in that the pupils will begin to apply their newly formed cognitive styles/processes in their current learning situations. However, if the structure and components of the intervention models are ineffective or if they do not facilitate improved learning, then the only difference that would be observed in subsequent years would be that amount of progress which is associated with the tooling-up process--a constant decremental gain.

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Insert Table 2 about here

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Table 2 shows the tooling-up and transference gains of the total group and of the four intervention models. The total group on the average gained 0.35 grade equivalent years of progress (GEP) over the tooling-up year (grade 4). This level of gain is also the decremental growth level for the group. Variations in the tooling-up period can be observed across the intervention models. Model 1 showed the greatest progress (0.65 GEP); Model 4 showed the least (0.25 GEP). Perusual over the average gains made over grades 5 and 6 indicates that significant

progress occurred over the total group and across each intervention model. The actual differences between the gains made during the tooling-up and transference years are shown in Column 3. These data show that the average pupil in the total sample increased his rate of growth in reading by 0.35 GEP or 100% during the transference years, causing a cumulative gain of 1.75 GEP over grades 4 to 6. This change in growth rate and cumulative gain may be best interpreted when one considers the average growth rate of the city. One finds that although the city's growth rate during the transference years is higher than the total Title 1 sample; the difference between its rate at grade four has decreased by 0.10 GEP and was only 0.05 GEP greater than that of the Title 1 group. However, the improvements in intervention Models 2 and 4 is equal to it.

In terms of cumulative gains, although the city's gains are 0.70 GEP behind that of national expectation, it was 0.55 GEP ahead of the Title 1 sample and slightly less than that of intervention Model 1. When one compares the cumulative decremental gains that would have accrued from the instructional materials alone (1.05 GEP), one finds that all of the intervention models were successful in producing conditions that facilitated improved rates of reading achievement.

To obtain an estimate of how these changes in rate of reading progress were reflected as achievement at grade 6, the cumulative gain of each group was added to its achievement score at the end of grade 3. Through this process, it was found that the city's average six grader had a grade equivalent score of 5.50. He was also 1.30 GE below national norms. The total Title 1 sample had an average GE score of 4.81, which

is 1.99 GE below the norm. If the Title 1 pupils had attained only a decremental gain, their average score would have been 4.11, which is 2.69 GE below national norms. Within the intervention models, however, we find that the average pupil in Model 1 is above the city's norm and only 0.73 GE below national norms. As is shown in Column 7, all of the intervention models have average scores that are above the decremental value.

Conclusions and Implications

Through the systematic placement of Title 1 projects in elementary schools, four Title 1 intervention models have been developed in Philadelphia. Each intervention model consists of project input services (Basic Skills, Instructional Other, Supportive) which are related to the identified needs of the target population. The number and variety of input services existing within a given elementary school was equivalent to the kinds and severity of pupil needs. In the four models, pupils in Model 1 had the lowest level of need; pupils in Model 4 had the greatest. Therefore, the greatest number (program density) and variety (program content) of project were found in the schools of Model 4.

The evaluation of the scores of 1,000 pupils from the target population revealed that the four intervention models were producing positive differential gains in reading achievement. (see Figure 1)

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Insert Figure 1 about here
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When compared with their initial rates of progress, the average pupil

increased his rate of progress in reading achievement by 100%. In Models 2, 3, and 4, the average pupil improved his rate of progress in reading by more than 100%. These results showed that the additive effects of the project input service configurations within the intervention models caused the development of skills/strategies which facilitate improved learning. When these rates of progress were compared with those of the city, it was found (1) that the rate of pupil progress in the target group was within 0.05 GE points of the city's pupils and (2) that the average rates of progress of pupils in Models 2 and 3 equaled that of the city.

When these rates were translated into cumulative gains over grades 4 through 6, it was found that the average pupil in the target group exceeded the chance growth increment by more than two-thirds of a year (0.70 GE). Within intervention models, the average pupil's growth in Model 1 (2.39 GE in 3 school years) exceeded that of the city's average pupil (2.30 GE/3 school years). In the other intervention models, the cumulative gains ranged from a low of 1.44 GE in Model 3 to 1.89 in Model 2.

To obtain an estimate of the achievement level of the target pupils when they leave the intervention program (grade 6), their cumulative gains were added to their pre-treatment scores (end of grade 3). This process showed that the average score of the pupils in the target group was within two-thirds of a year (0.69 GE) of that of the city's pupils. Within the specific intervention models, the average score of Model 1 pupils was 0.57 GE years higher than the city's, and those in Model 2 were within 0.50 GE years of the city's. The other two model's

average scores were approximately one year below the city's.

When comparing the relative position of the sixth-grade pupil's score to the national norm (6.80 GE), it was found that although the average sixth-grade pupil in the city was about 1.30 GE/years below the norm, the average pupil in intervention Model 1 was only 0.73 GE years below the norm. However, the average pupil in the target population was about 2.00 GE years behind.

Implications

This study suggests that increased pupil outputs are possible through Federal Acts which intensify the efforts of compensatory education. The results of this study seem to indicate that it is possible to create learning climates through Title I projects (a) which motivate the disadvantaged urban child to learn and (b) which tap, reconstruct, and materalize those cognitive and affective abilities/skills which produce effective learning. It appears as if the project input service configurations of the intervention models have zeroed-in on the kinds of instructional ingredients that are needed to facilitate significant changes in the achievement patterns of their respective pupil groups. However, because their rates of progress were not commensurate with that of national expectation, their relative positions remained below national norms and would give the impression that no direct benefits had been derived from the inventment of Title 1 funds.

But, because the implementation models increased the average pupil's reading achievement rate by 100%, it seems quite possible that the desired goal may be reached--one full year of achievement for each

year of formal education. As is evidenced by the results of this study, after the initial investment of such funds, there comes a time when additional monies/resources are needed to achieve the desired objective. At that stage of development, the additional funds would not be realized as the poliferation of new projects, but, rather as a means for intensfying or concentrating the component input services provided by the existing intervention models. In the case cited, since Model 4 supports a remediation program, the intensification would mean an increase in the number of Instructional Centers or the placement of Instructional Centers in each of the model's schools. This would relieve some of the time-sharing that occurs between some of the schools and thereby, increase the number of instructional hours each pupil receives.

Finally, this study suggests that when an impact component procedure is used to determine the effects of Title 1 funds on pupil achievement, one will find that the allocation of projects within a school system will form one or more intervention treatments which were designed to meet the needs of its target population. And that when the component input services provided by such intervention models are maximized, the probability of reaching the national goals of compensatory education is increased significantly.

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TABLE 1

Average Reading and Reading Achievement Scores of 1,000 Paired Title I Pupils Summarized by Intervention Models and Total Pupil Population

Year	Grade	Model				All Models
		1	2	3	4	
1969	3	3.68[a]	3.11	2.80	3.00	3.06
1970	4	4.33	3.48	3.08	3.25	3.41
	Gain	.65	.37	.28	.25	.35
1969	4	4.34	3.30	3.34	3.23	3.49
1970	5	5.24	4.14	3.97	3.93	4.24
	Gain	.90	.84	.63	.70	.75
1969	5	5.16	4.13	4.16	4.09	4.31
1970	6	6.00	4.81	4.69	4.76	4.96
	Gain	.74	.68	.53	.67	.65

[a]Grade Equivalent scores, Iowa Tests of Basic Skills, May 1970.

TABLE 2

Summary Data Showing the Total and Model Effects of the Title I Intervention Treatments on Elementary School Children in Philadelphia

Group	Average Gain		Difference Between Average Gains	Cumulative Gains (4-6)	Achievement Levels		Achievement Status at the end of Grade 6 (Norm = 6.8)
	Grade 4	Grades 5&6			End of Grade 3	End of Grade 6	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
National	1.00	1.00	- -	3.00	3.80	6.80	- -
City-Wide	.50	.90	+.40	2.30	3.20	5.50	-1.30[b]
Intervention Treatment--Grades 4-6							
Decremental	.35[a]	.35	- -	1.05	3.06	4.11	-2.69
All Models	.35	.70	+.35	1.75	3.06	4.81	-1.99
Model 1	.65	.87	+.22	2.39	3.68	6.07	-0.73
Model 2	.37	.76	+.39	1.89	3.11	5.00	-1.80
Model 3	.28	.58	+.30	1.44	2.80	4.24	-2.56
Model 4	.25	.68	+.43	1.61	3.00	4.61	-2.19

[a] That average gain produced by the interaction between the total population and the treatment, which would remain about the same if the intervention treatment were ineffective.

[b] Difference between National grade equivalent and group's score.

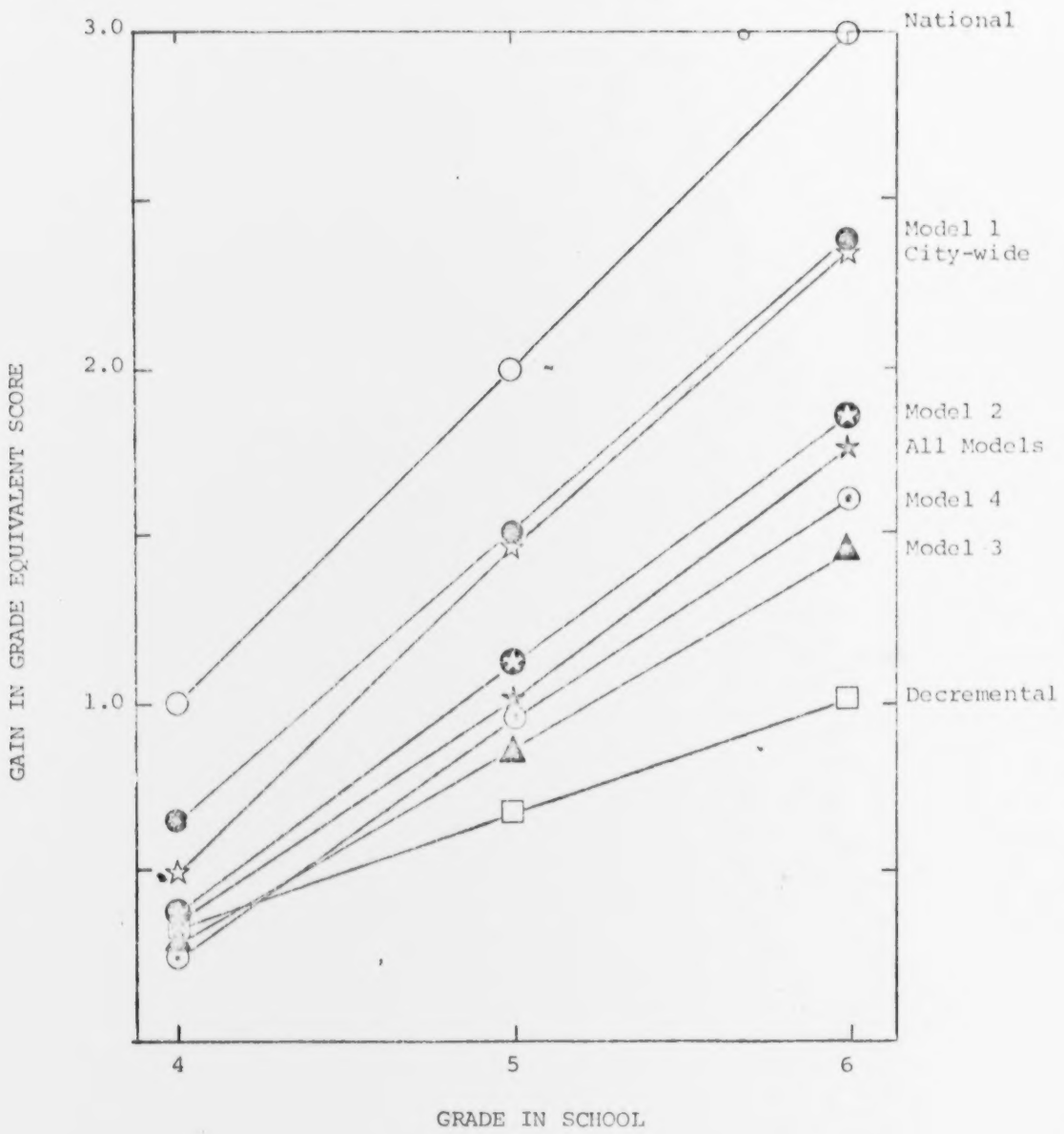

Figure 1. Average Reading Achievement Growth Curves for the Nation, the City, Title I Decremental and Program Models.